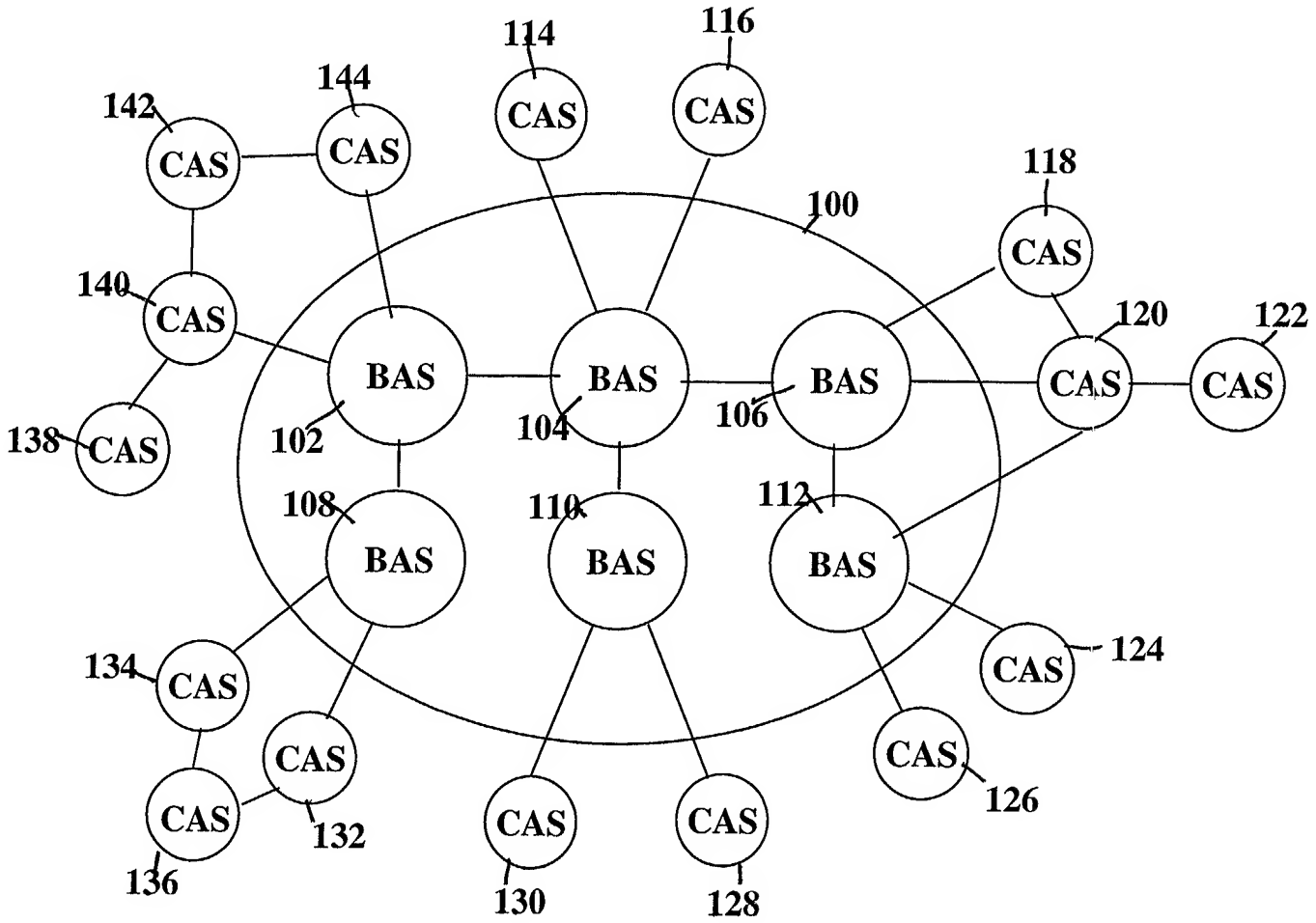

114
116
144
142
CAS
CAS
CAS
CAS
118
100
CAS
140
CAS
120
122
BAS
BAS
BAS
CAS
CAS
138
CAS
102
104
106
108
110
112
BAS
BAS
BAS
134
CAS
124
CAS
CAS
CAS
CAS
126
132
136
130
128

FIG. 1

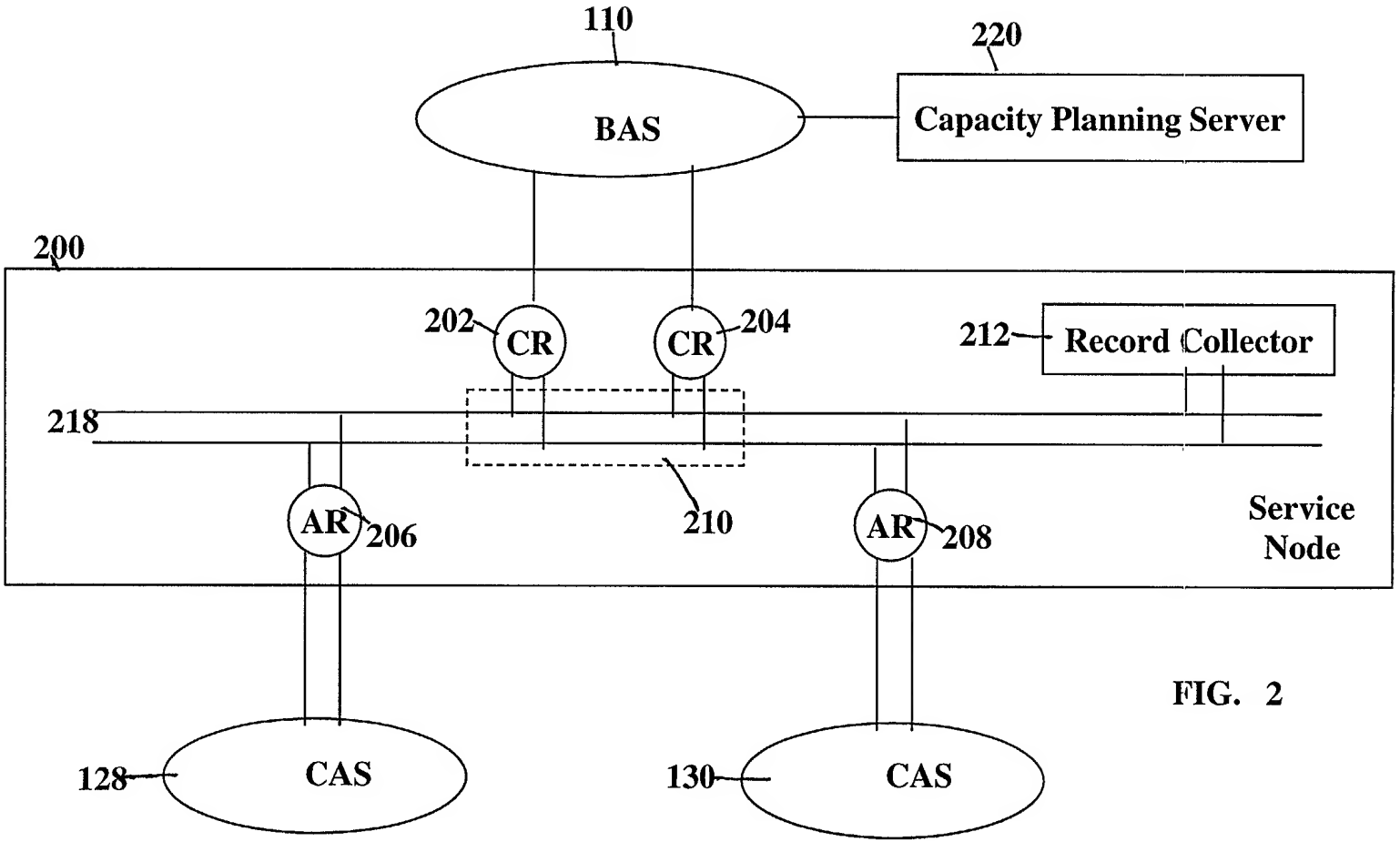

110
220
BAS
Capacity Planning Server
200
202
CR
CR
204
212
Record Collector
218
AR
206
210
AR
208
Service
Node
128
CAS
130
CAS

FIG. 2

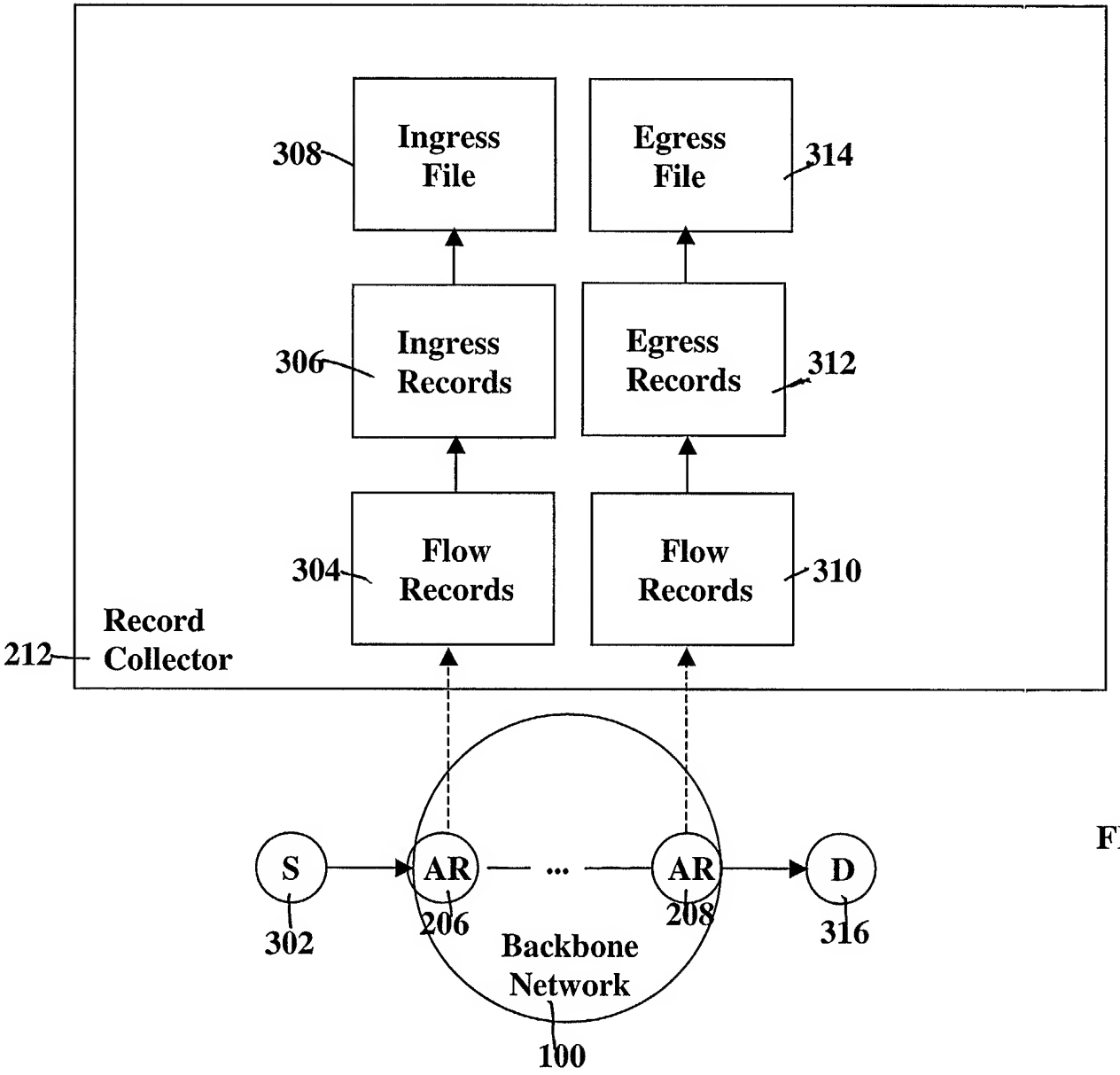

Ingress File
308
Egress File
314
Ingress Records
306
Egress Records
312
Flow Records
304
Flow Records
310
Record Collector
212
S
302
AR
206
...
AR
208
D
316
Backbone Network
100

FIG. 3

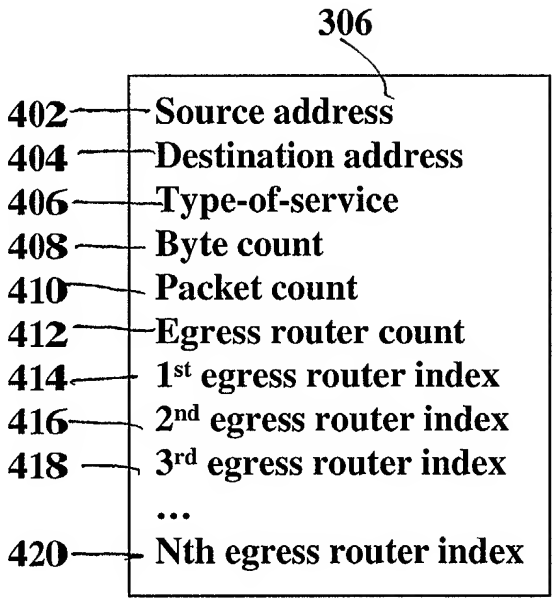

306
402
Source address
404
Destination address
406
Type-of-service
408
Byte count
410
Packet count
412
Egress router count
414
1st egress router index
416
2nd egress router index
418
3rd egress router index
...
420
Nth egress router index

FIG. 4

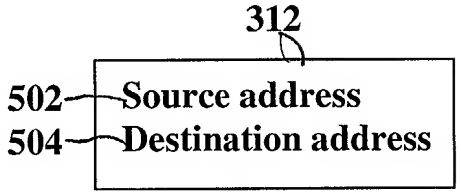


FIG. 5

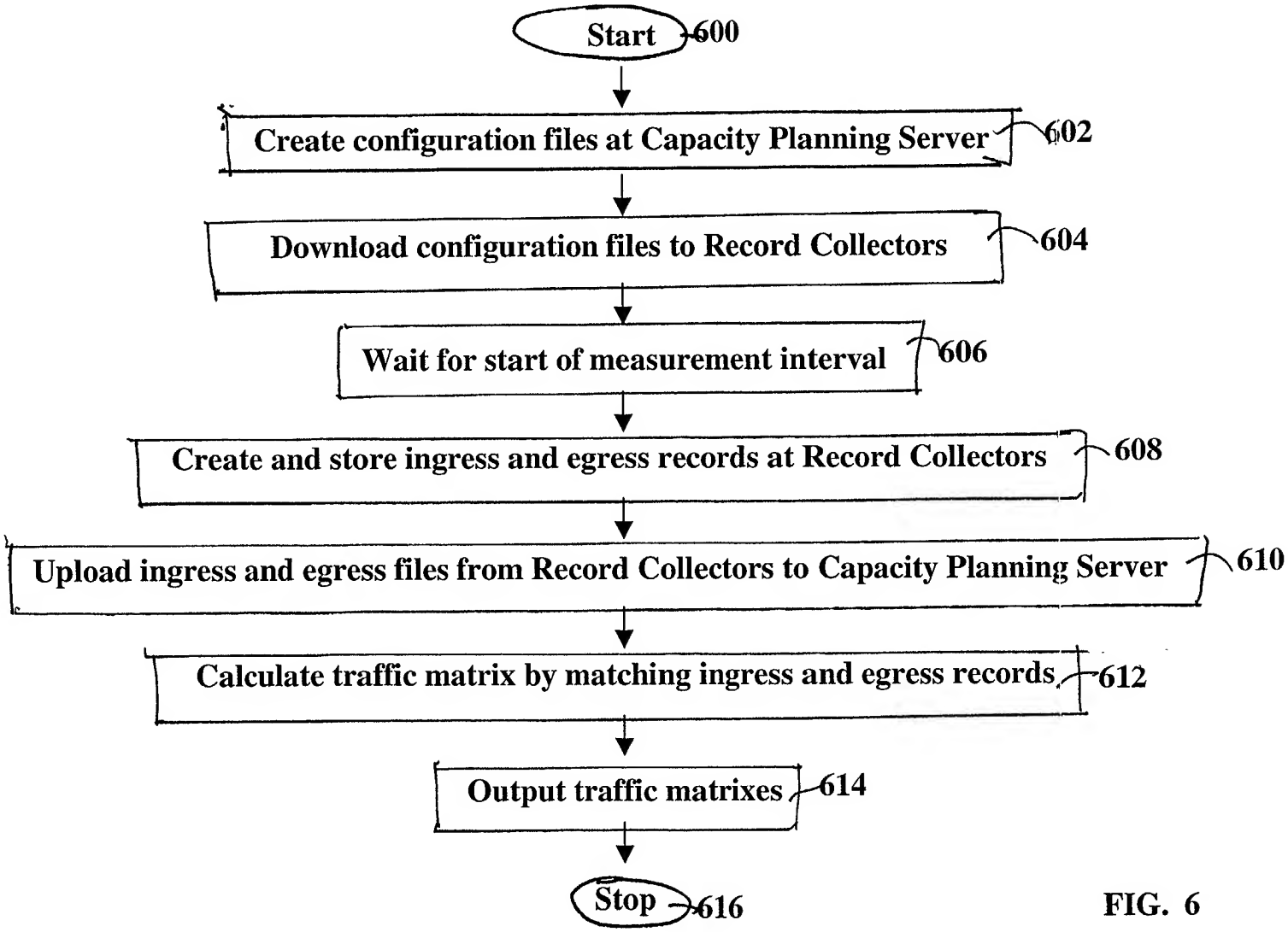

Start
600
Create configuration files at Capacity Planning Server
602
Download configuration files to Record Collectors
604
Wait for start of measurement interval
606
Create and store ingress and egress records at Record Collectors
608
Upload ingress and egress files from Record Collectors to Capacity Planning Server
610
Calculate traffic matrix by matching ingress and egress records
612
Output traffic matrixes
614
Stop
616

FIG. 6

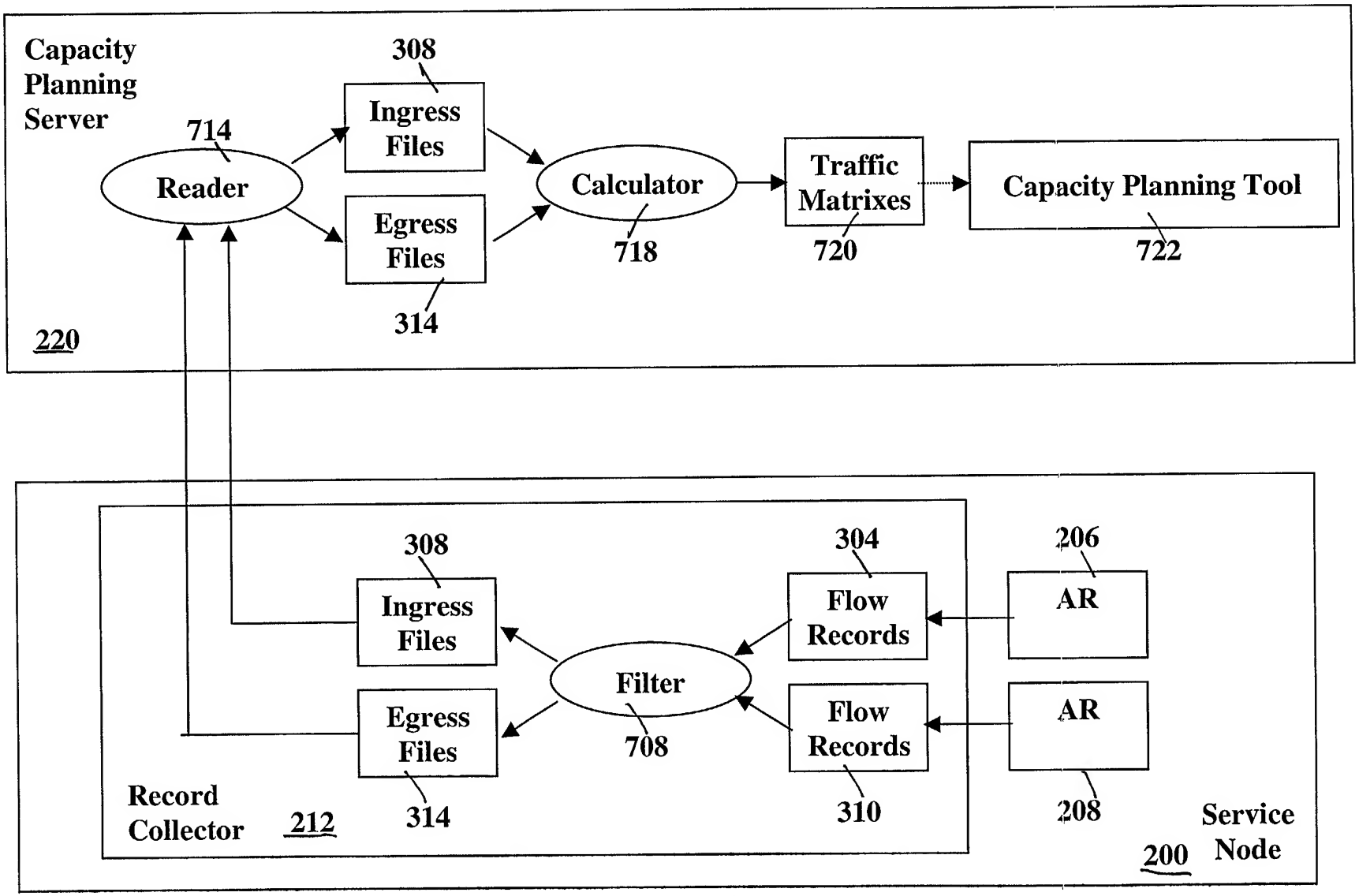
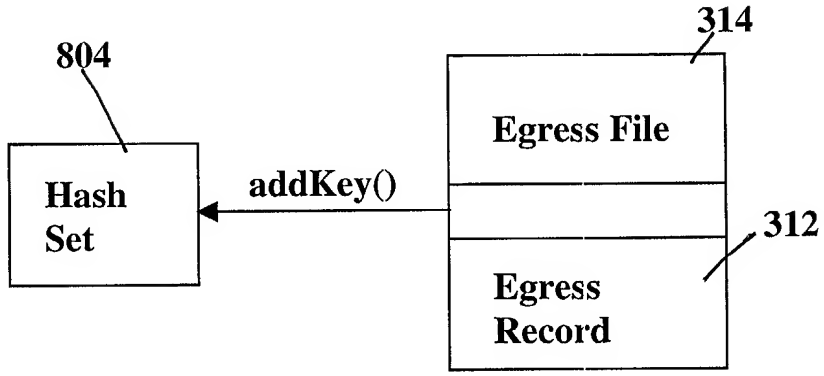

Capacity Planning Server
308
Ingress Files
714
Reader
Egress Files
314
Calculator
718
Traffic Matrixes
720
Capacity Planning Tool
722
220
308
Ingress Files
Egress Files
314
Filter
708
304
Flow Records
Flow Records
310
206
AR
AR
208
Record Collector
212
Service Node
200

FIG. 7

FIG. 8A



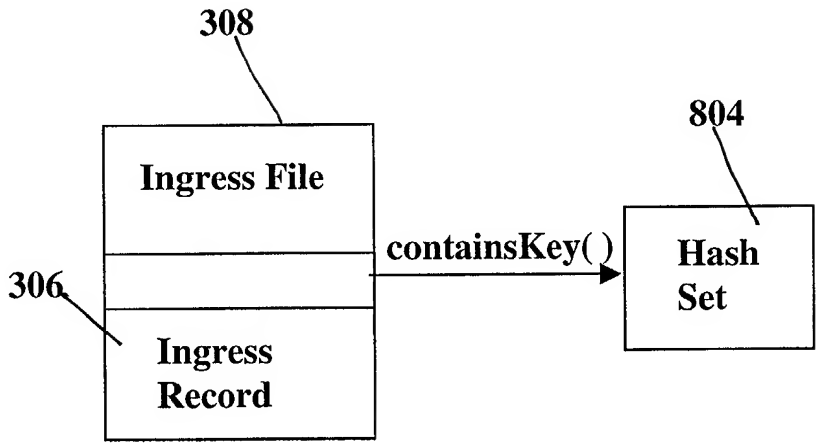


FIG. 8B

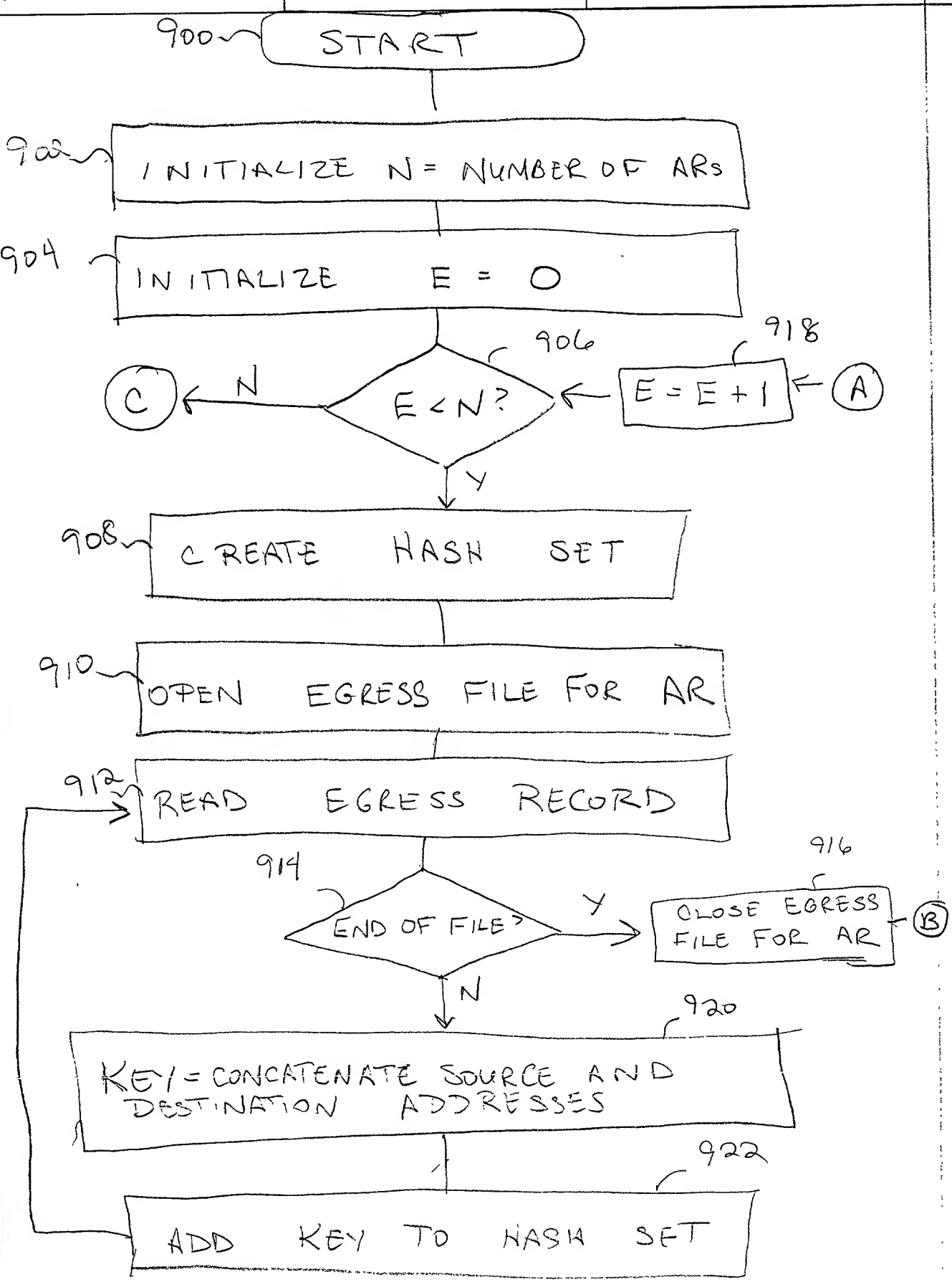
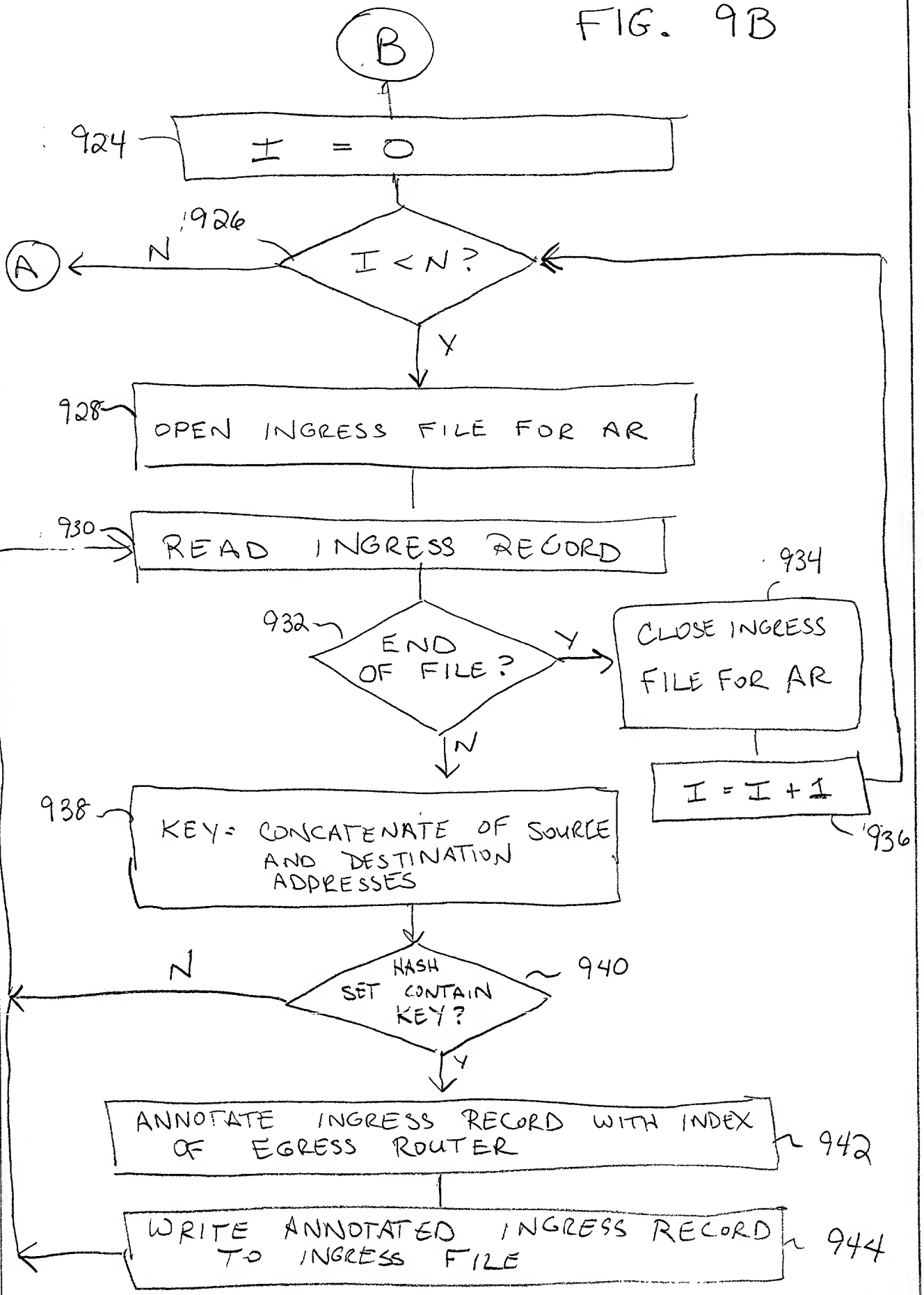


FIG. 9A

FIG. 9B



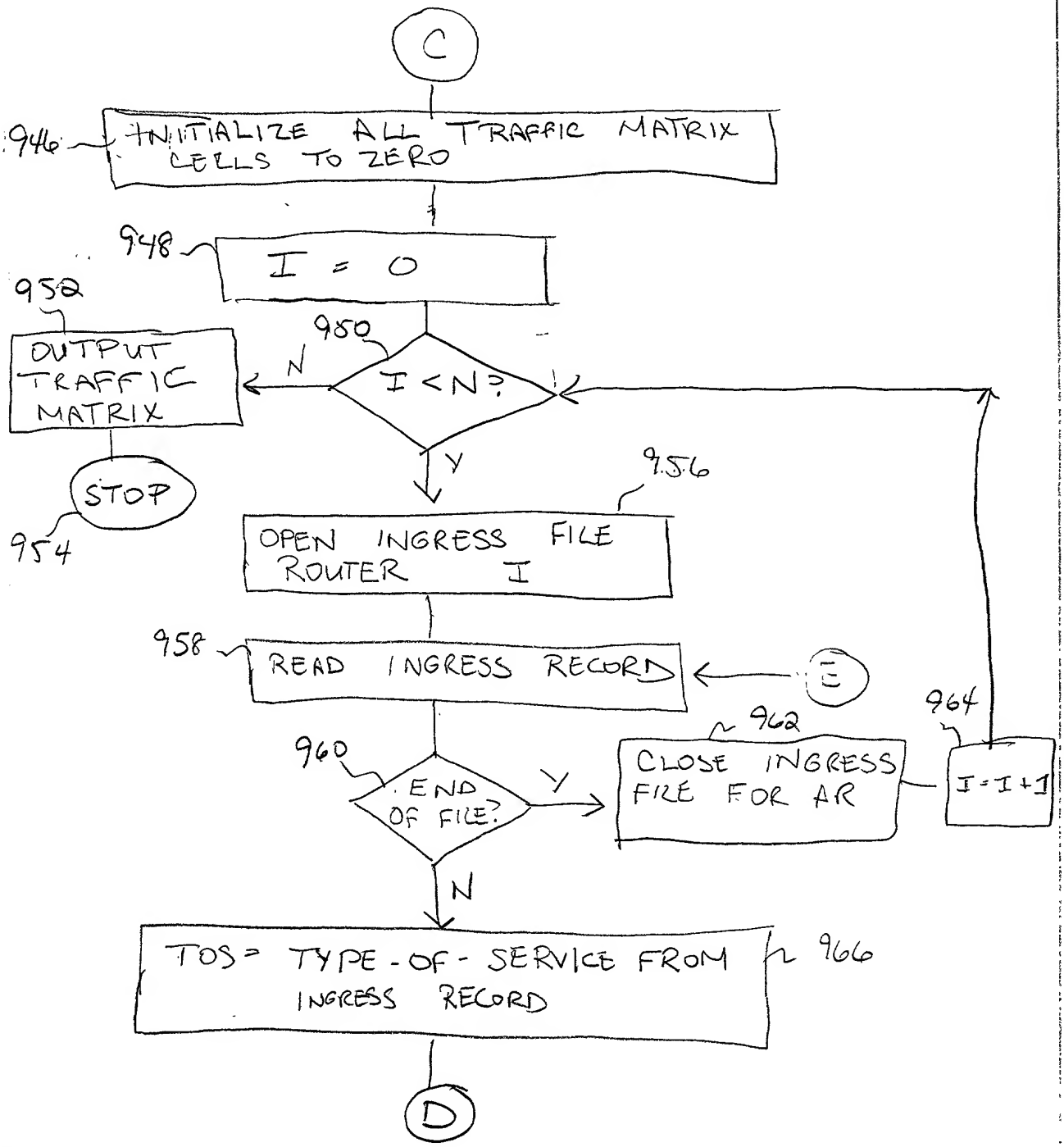


FIG. 9C

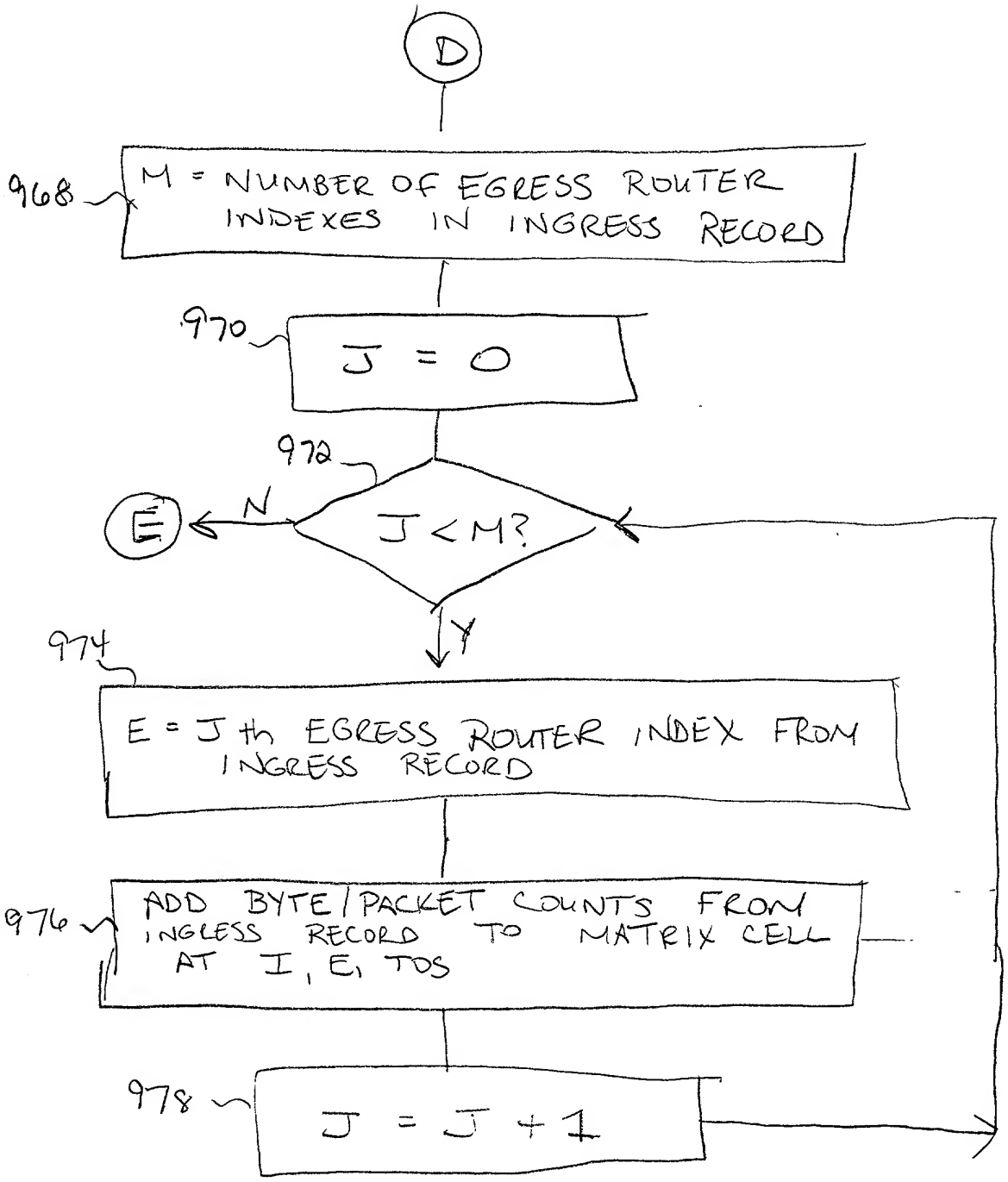


FIG. 9D

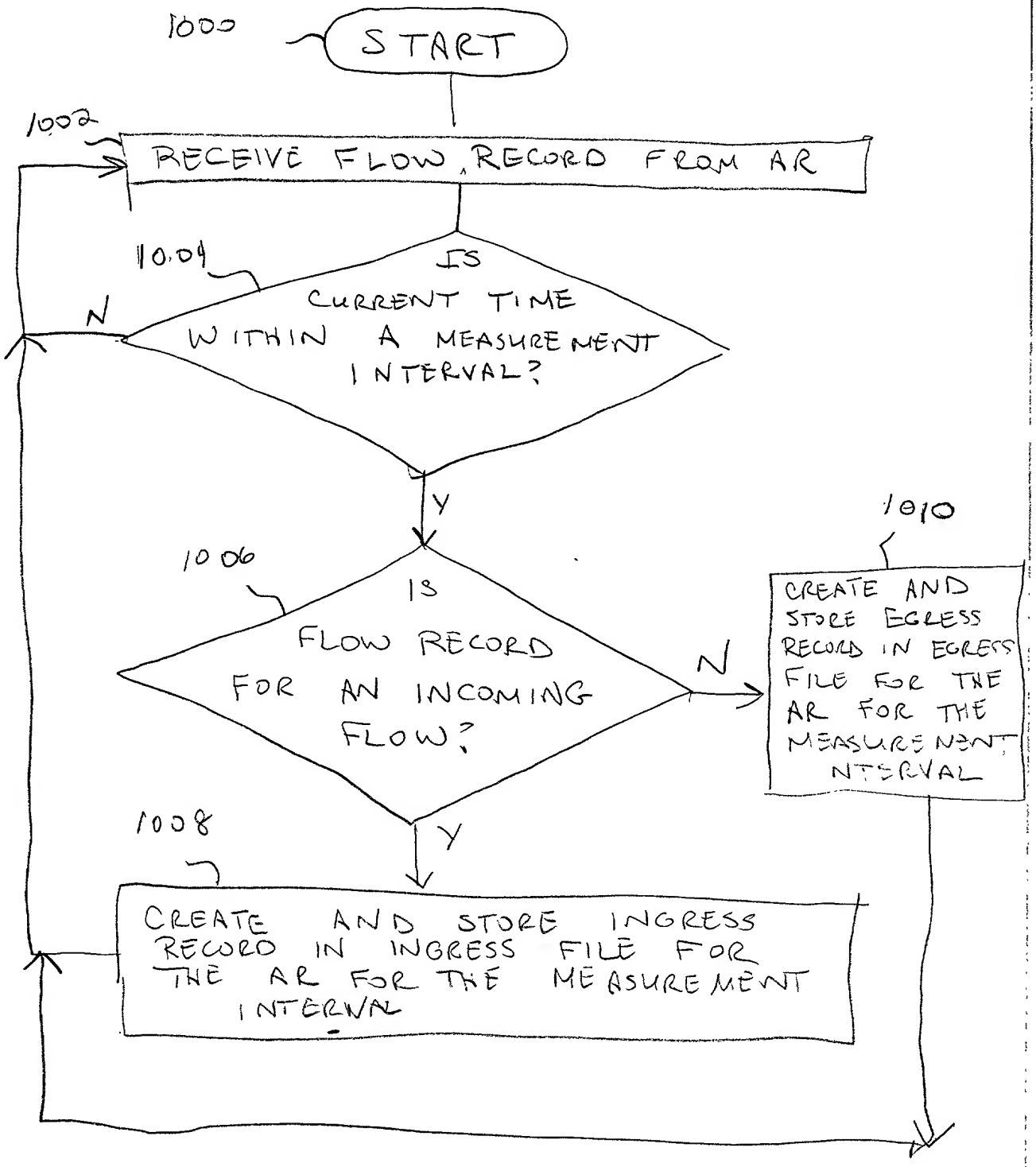


FIG. 10

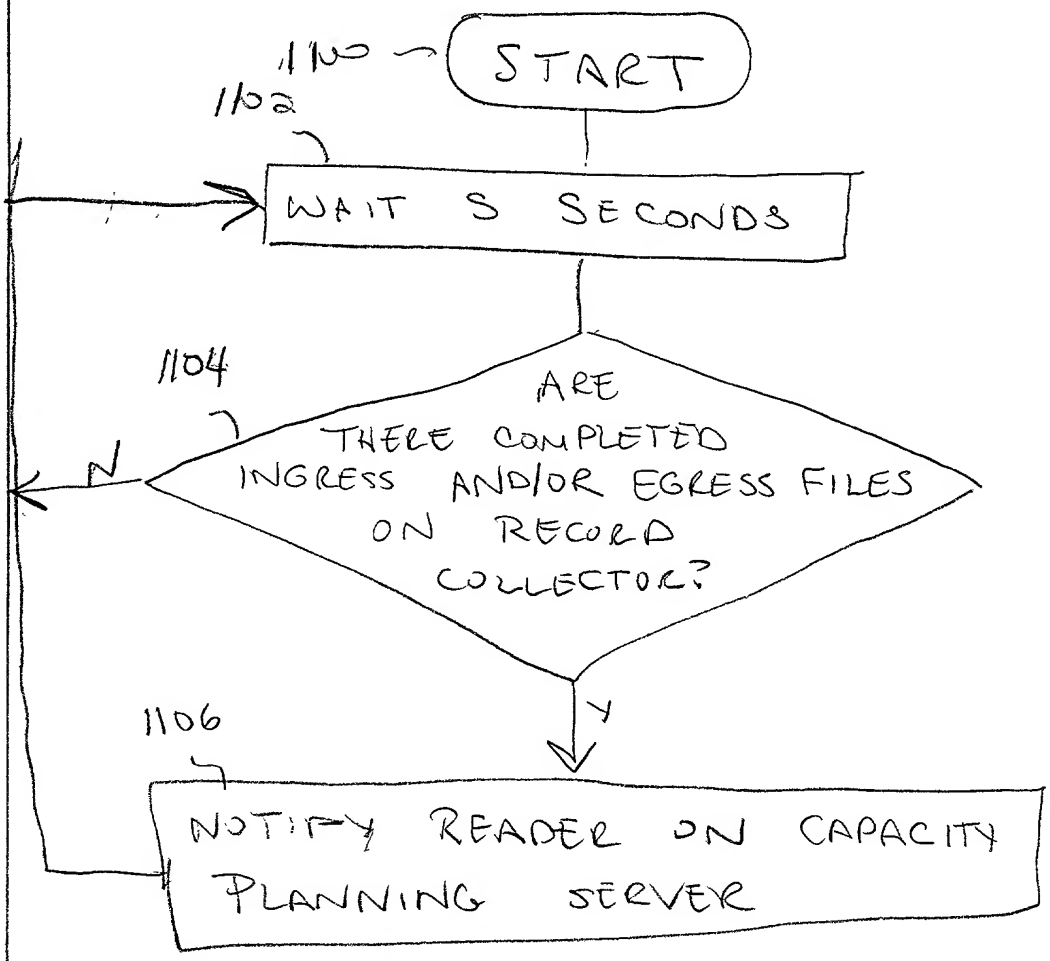


FIG 11

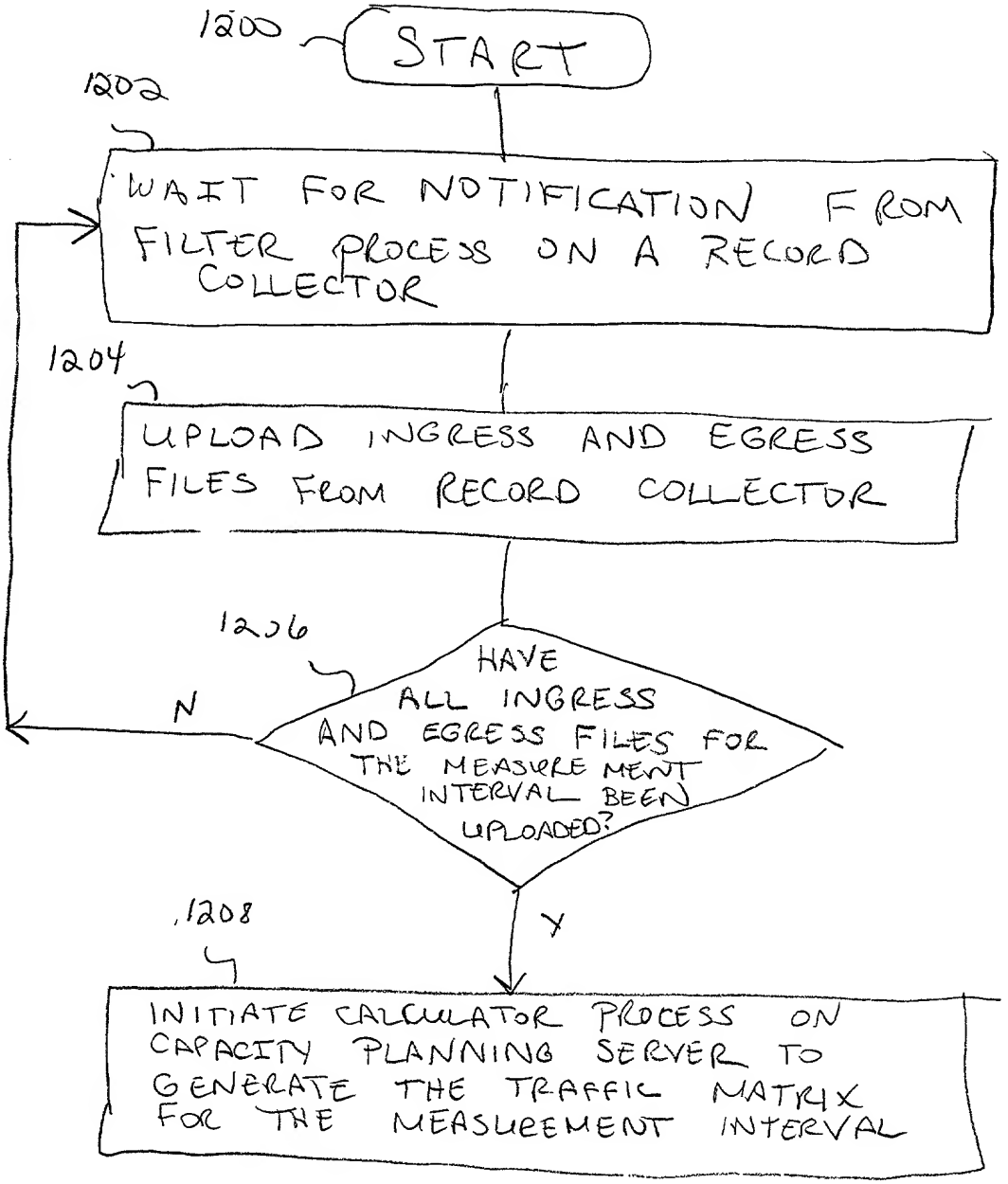


FIG. 12

Fig. 13

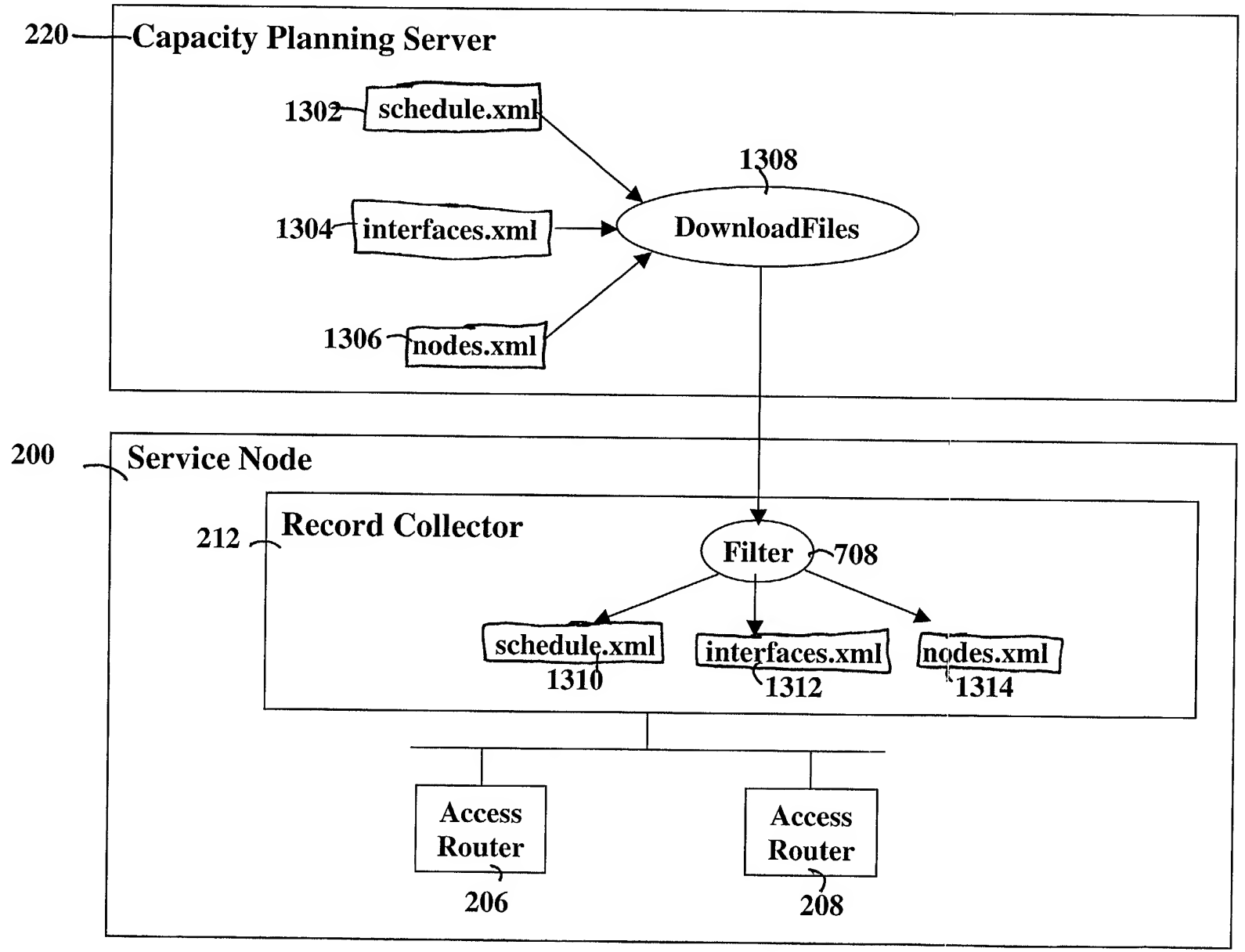
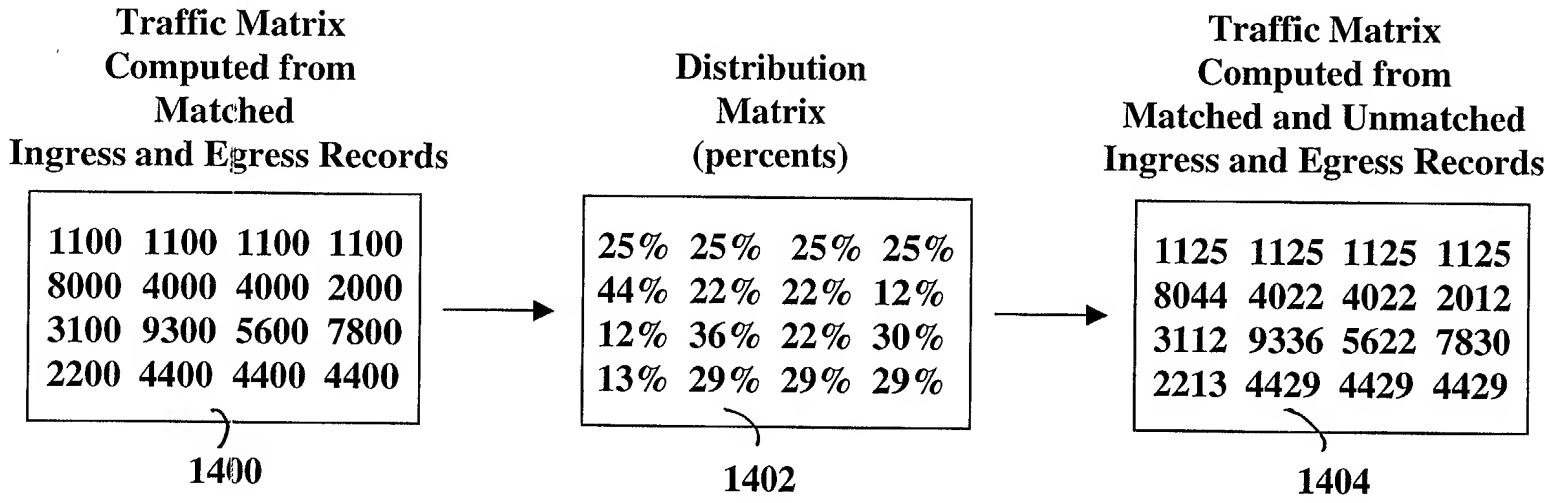

220
Capacity Planning Server
1302
schedule.xml
1308
1304
interfaces.xml
DownloadFiles
1306
nodes.xml
200
Service Node
212
Record Collector
Filter
708
schedule.xml
1310
interfaces.xml
1312
nodes.xml
1314
Access Router
206
Access Router
208

Fig. 14


Traffic Matrix Computed from Matched Ingress and Egress Records
1100 1100 1100 1100
8000 4000 4000 2000
3100 9300 5600 7800
2200 4400 4400 4400
1400
Distribution Matrix (percents)
25% 25% 25% 25%
44% 22% 22% 12%
12% 36% 22% 30%
13% 29% 29% 29%
1402
Traffic Matrix Computed from Matched and Unmatched Ingress and Egress Records
1125 1125 1125 1125
8044 4022 4022 2012
3112 9336 5622 7830
2213 4429 4429 4429
1404

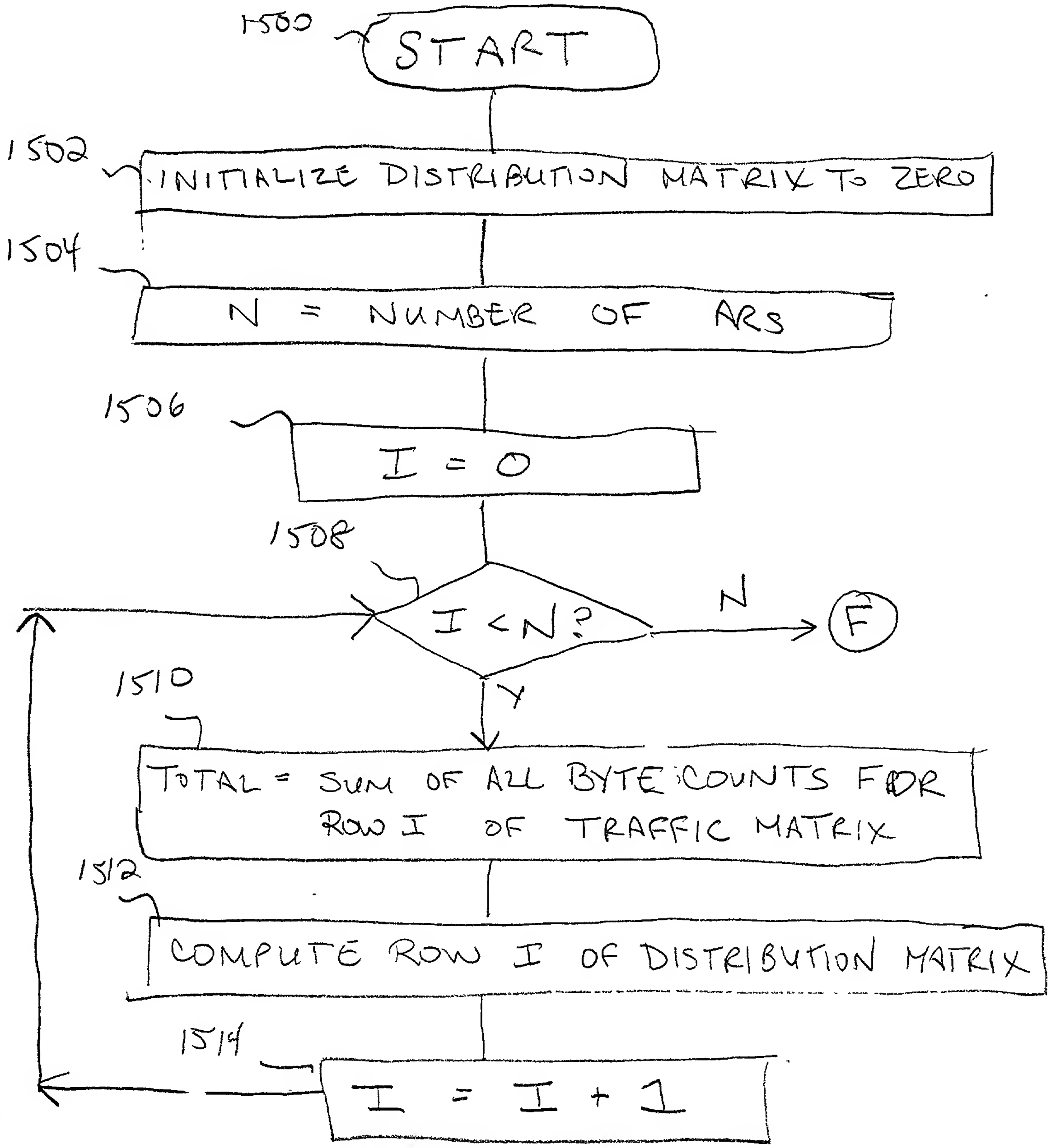

1500
START
1502
INITIALIZE DISTRIBUTION MATRIX TO ZERO
1504
N = NUMBER OF ARS
1506
I = 0
1508
I < N?
N
F
Y
1510
TOTAL = SUM OF ALL BYTE COUNTS FOR ROW I OF TRAFFIC MATRIX
1512
COMPUTE ROW I OF DISTRIBUTION MATRIX
1514
I = I + 1

FIG. 15A

FIG 15 B

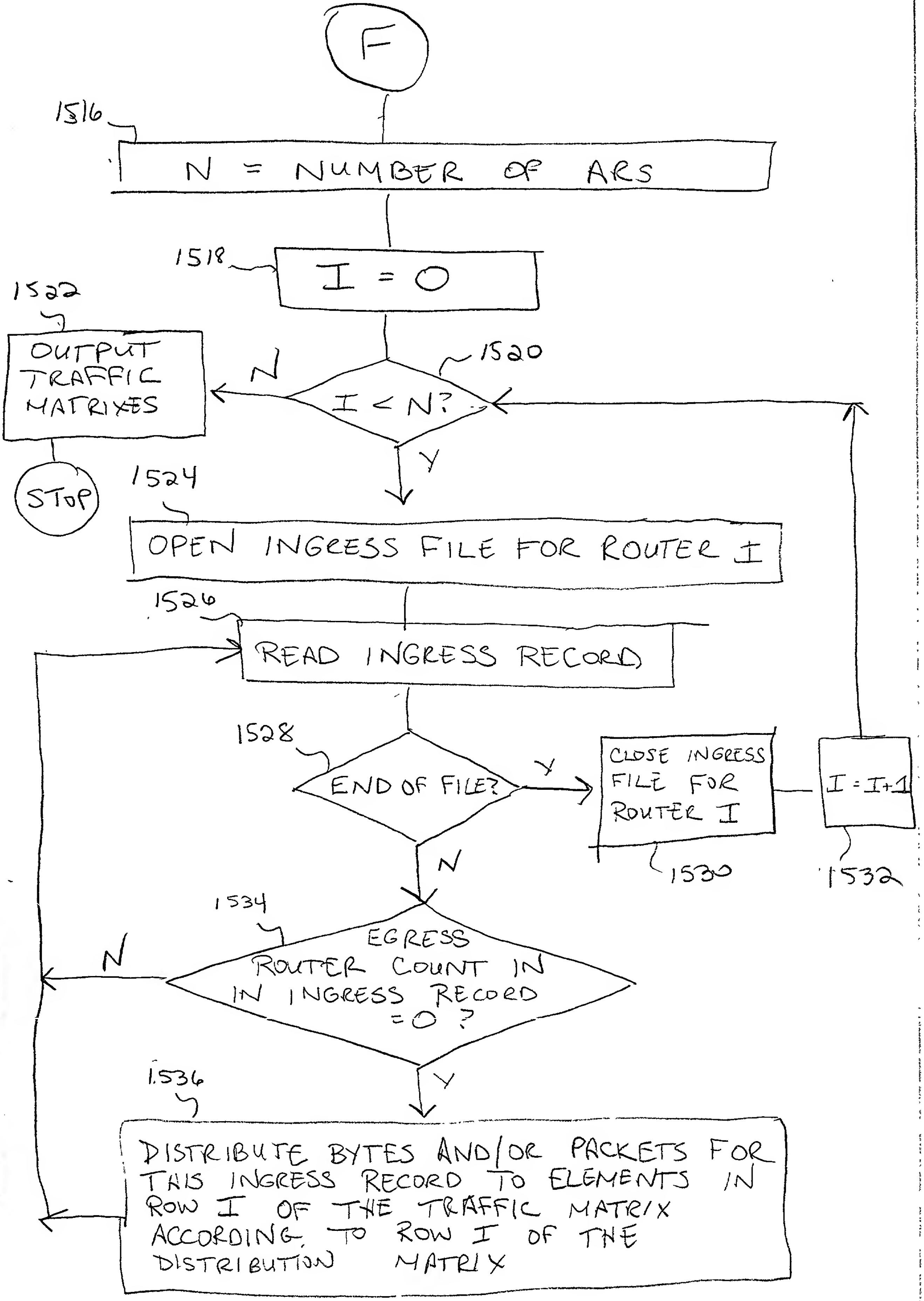
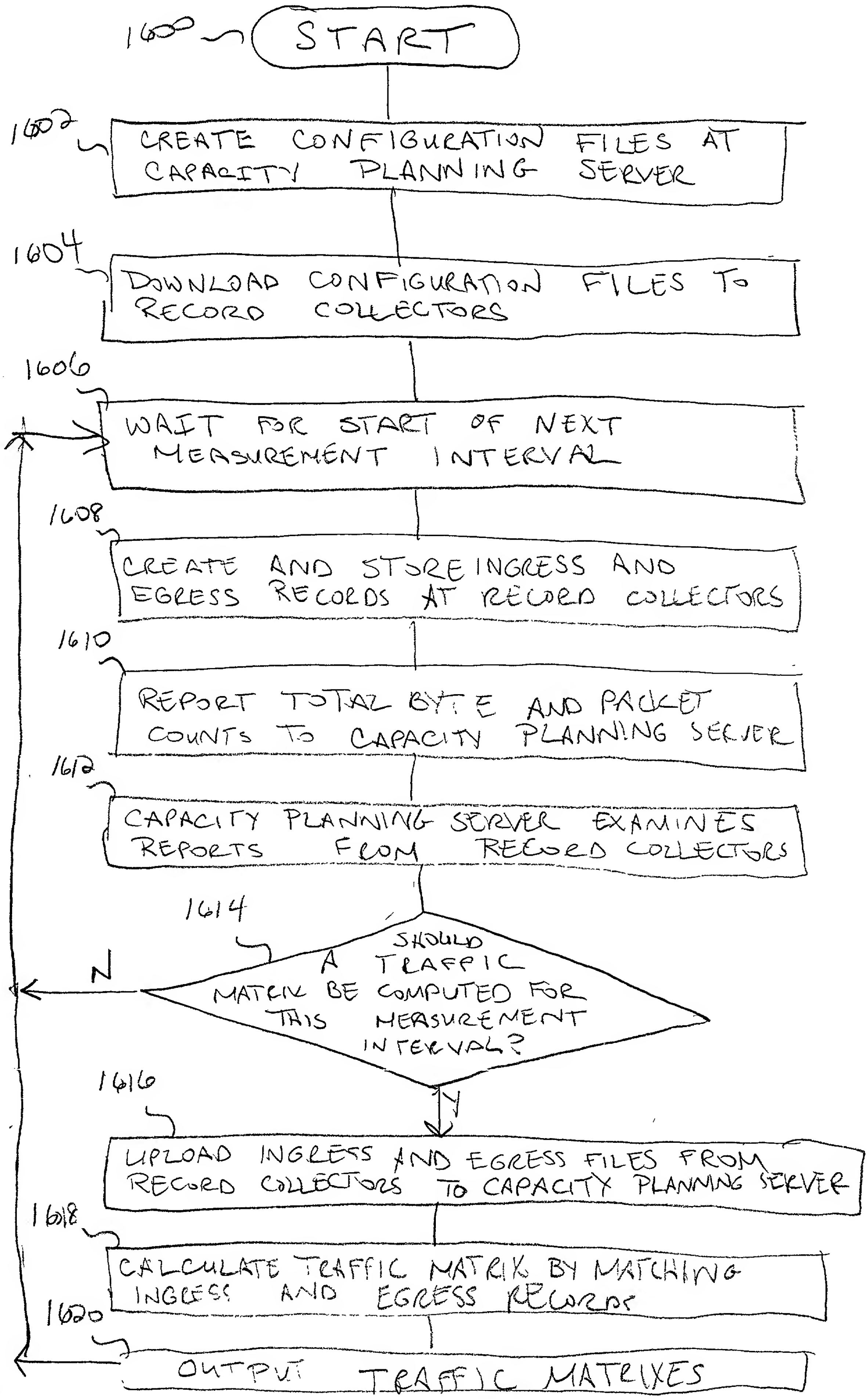


FIG. 16



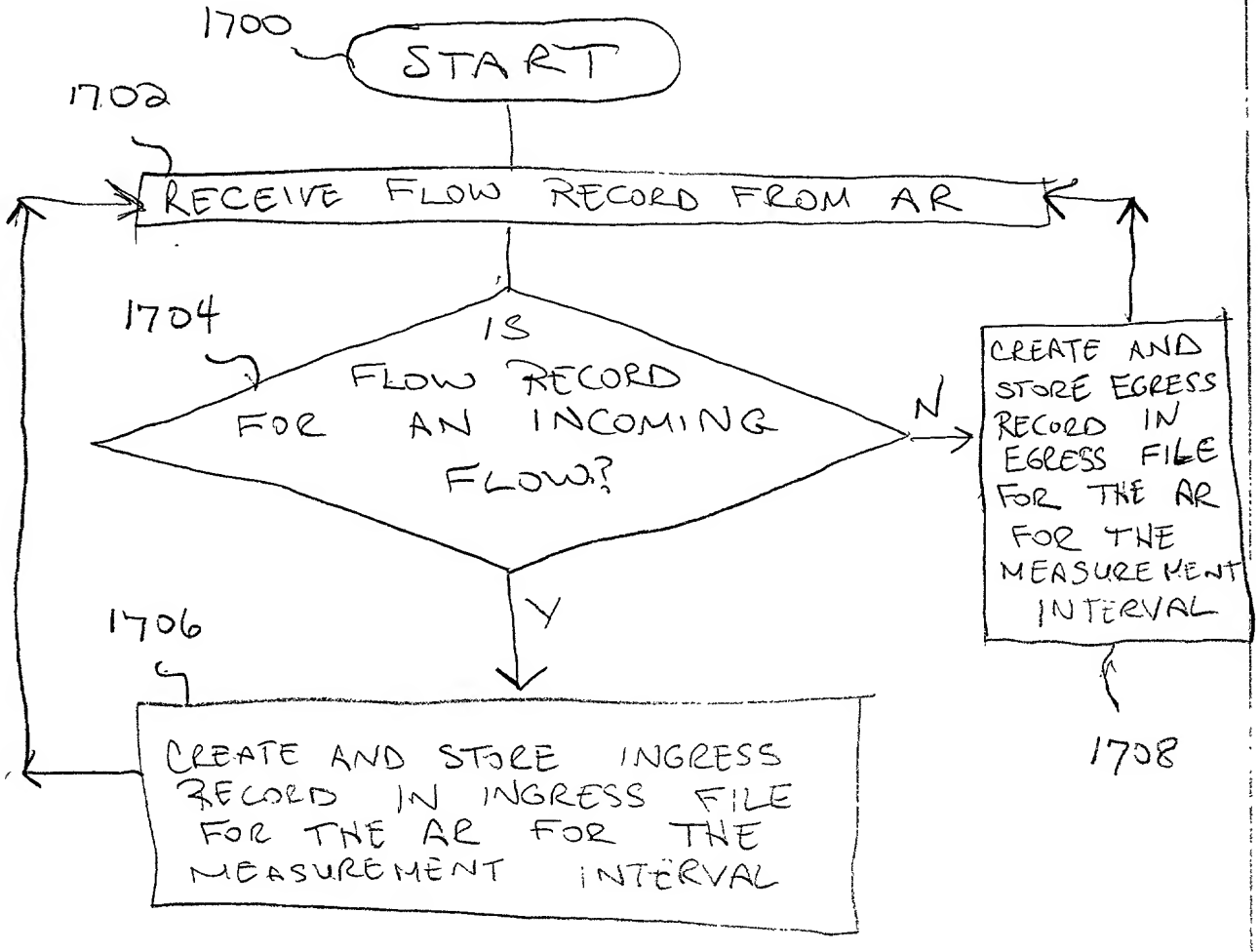
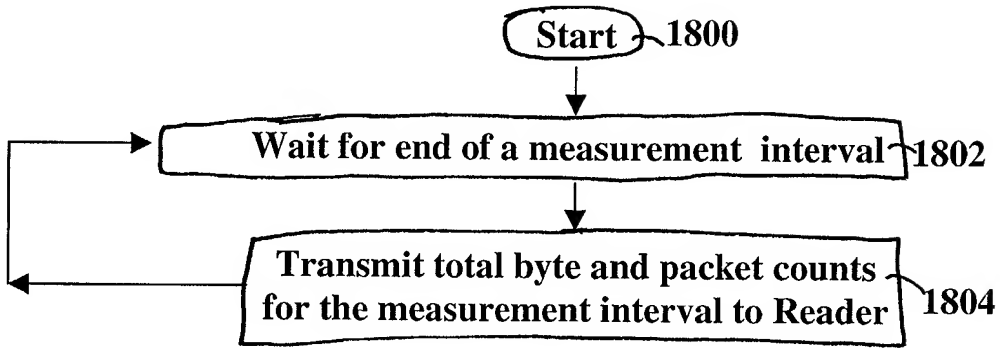


FIG. 17

Fig. 18


Start
1800
Wait for end of a measurement interval
1802
Transmit total byte and packet counts for the measurement interval to Reader
1804

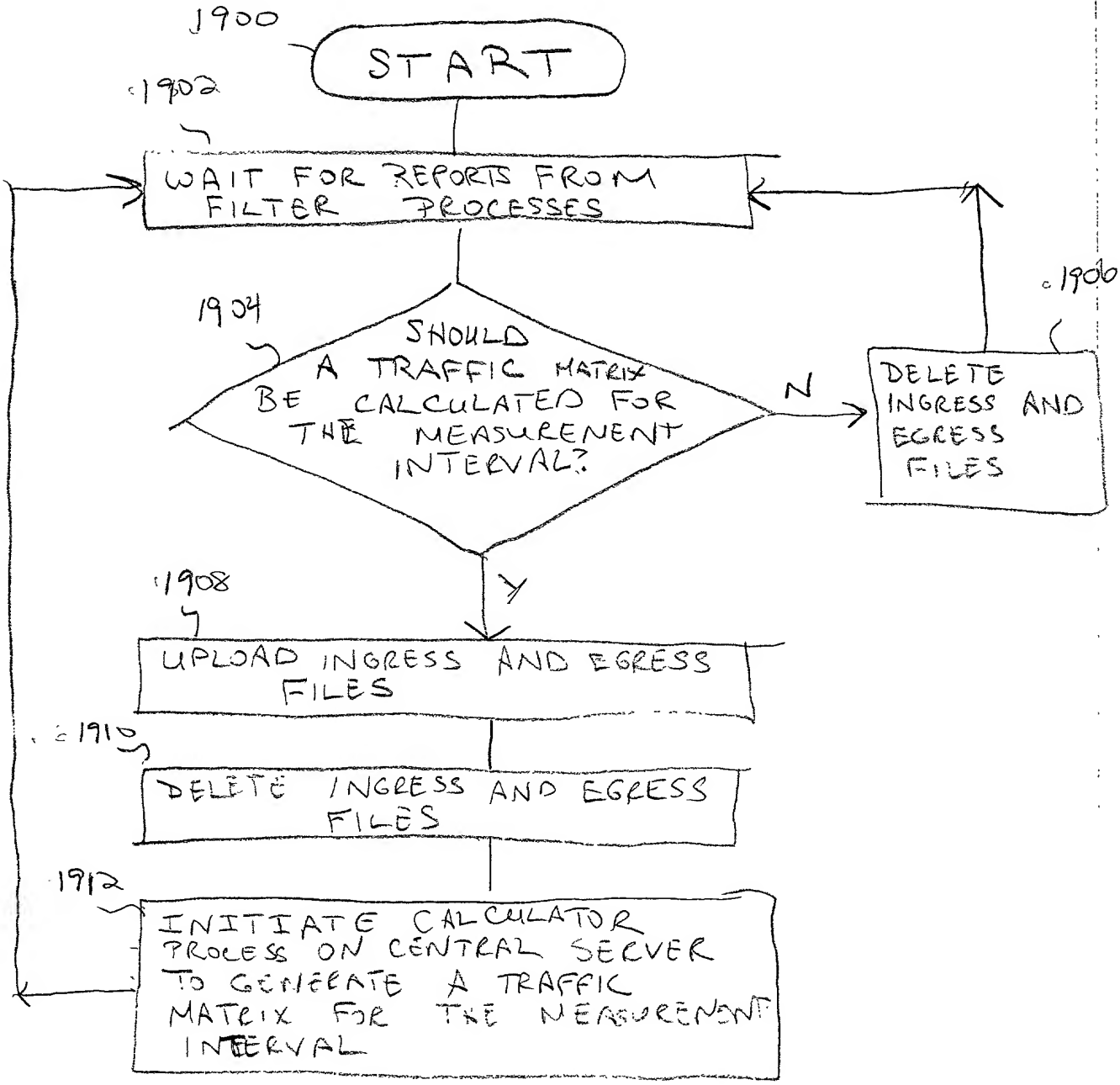
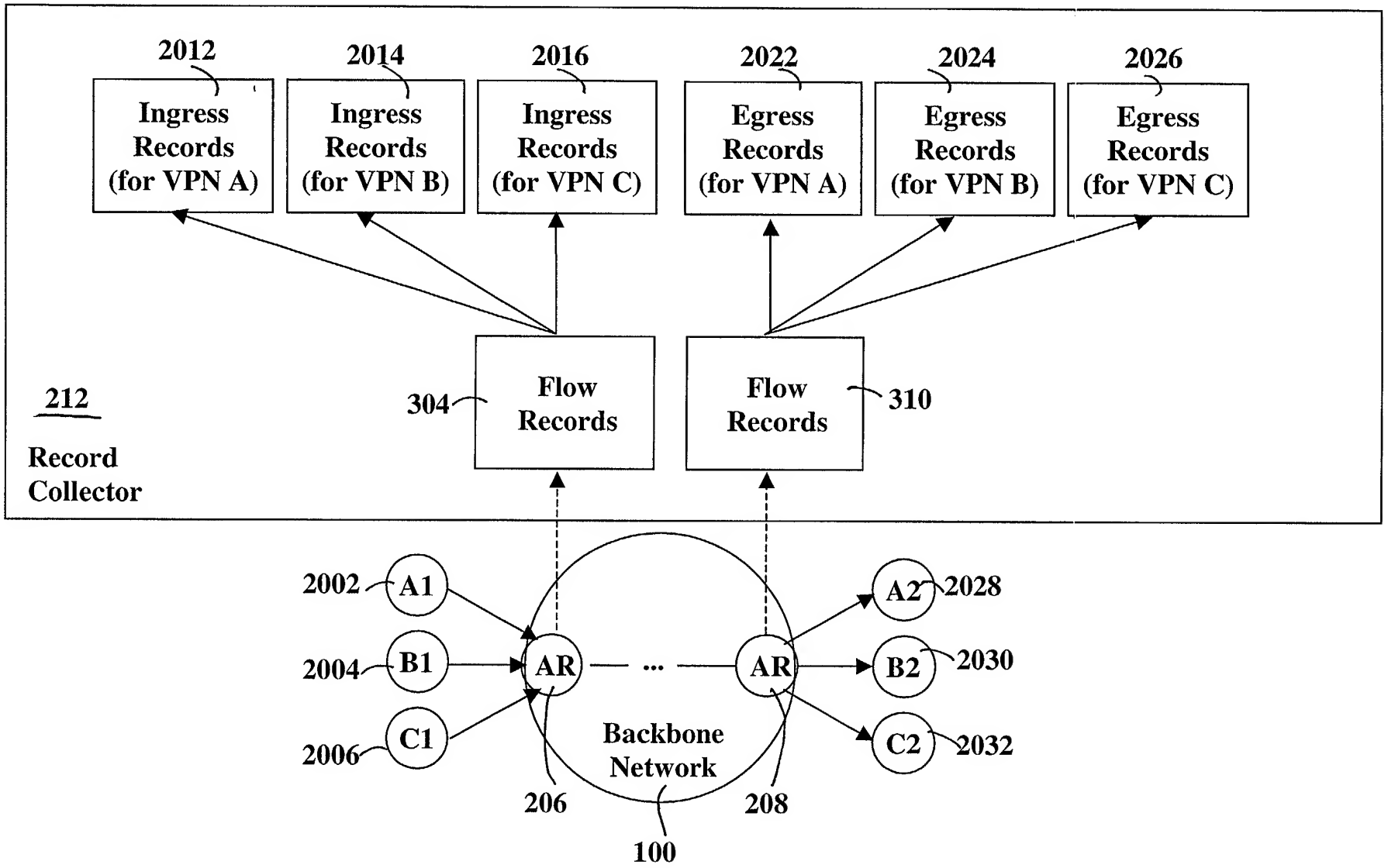


FIG. 19

Fig. 20


2012
2014
2016
2022
2024
2026
Ingress Records (for VPN A)
Ingress Records (for VPN B)
Ingress Records (for VPN C)
Egress Records (for VPN A)
Egress Records (for VPN B)
Egress Records (for VPN C)
212
Record Collector
304
Flow Records
Flow Records
310
2002
A1
2004
B1
2006
C1
AR
...
AR
A2
2028
B2
2030
C2
2032
Backbone Network
206
208
100

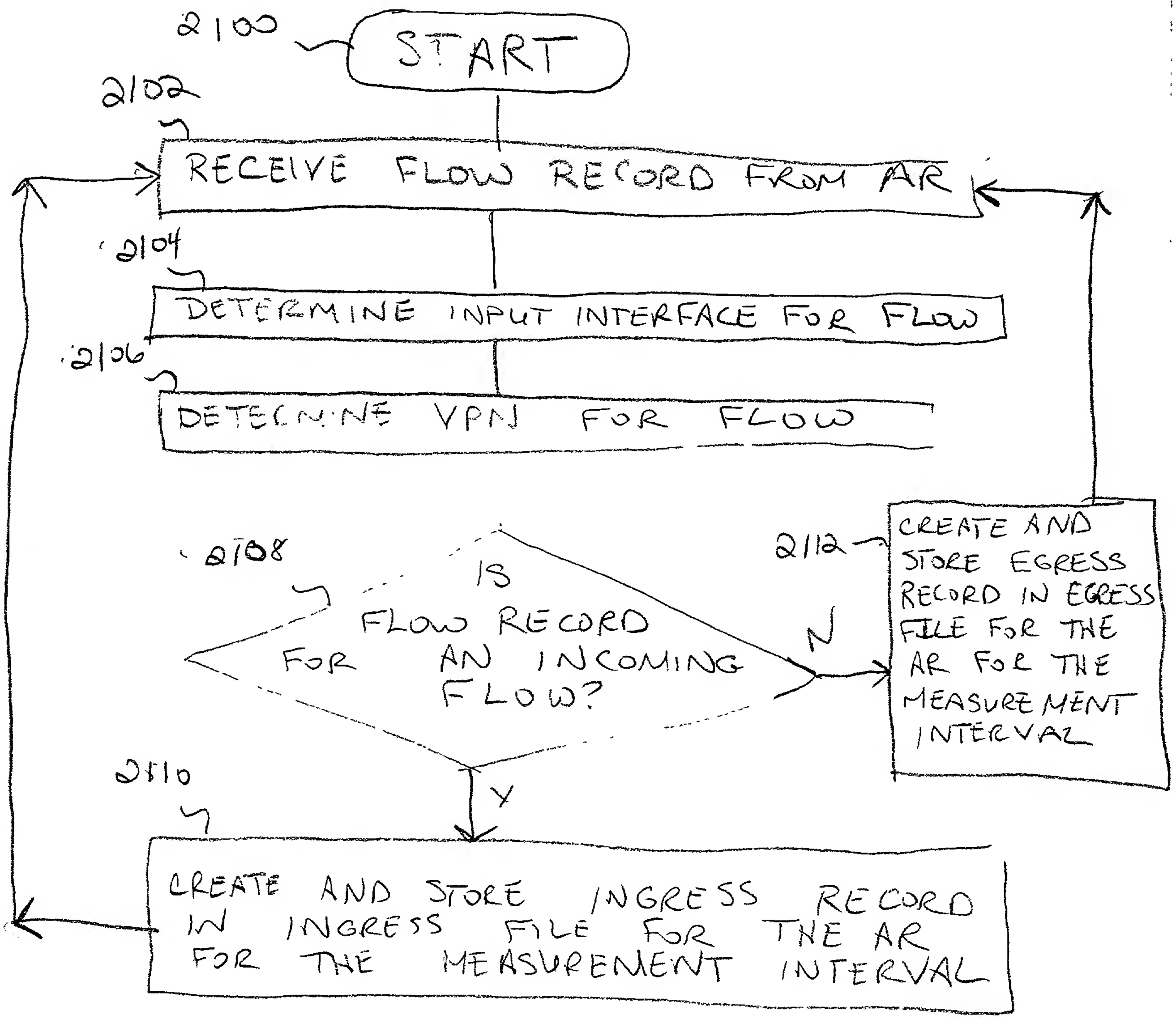


FIG. 21